

# PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2000-252548  
(43)Date of publication of application : 14.09.2000

(51)Int.Cl. H01L 43/08  
G11B 5/39

(21)Application number : 11-374033  
(22)Date of filing : 28.12.1999

(71)Applicant : TOSHIBA CORP  
(72)Inventor : KAMIGUCHI YUZO  
YUASA HIROMI  
SAHASHI MASASHI  
IWASAKI HITOSHI

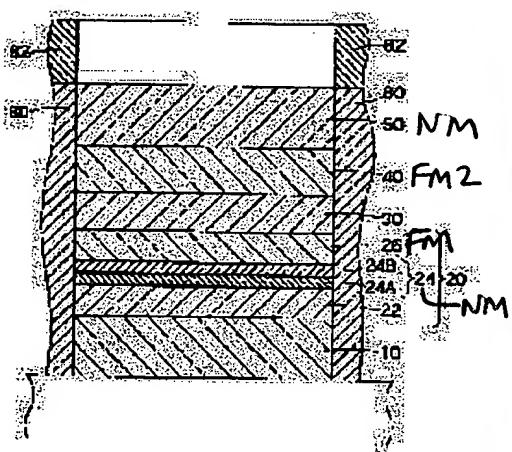
(30)Priority  
Priority number : 10377385 Priority date : 28.12.1998 Priority country : JP

## (54) MAGNETORESISTIVE EFFECT ELEMENT AND MAGNETIC RECORDER

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To secure magnetic coupling of ferromagnetic metallic layers and to obtain an excellent magnetized stuck surface, causing mirror reflection of electrons to occur, by providing a nonmetallic layer as an electron reflecting layer in the middle of the magnetized stuck layer, and laminating two kinds of layers as a backing for the nonmetallic layer.

**SOLUTION:** By forming a nonmetallic layer 50 on a second magnetic layer 40 first of all, mirror reflection of electrons is caused to occur between these layers. As the result of this, it becomes possible to reduce the loss of momentum of the electrons. In addition, it becomes possible to cause mirror reflection of electrons to occur even at the interface between a second ferromagnetic metallic layer 26 and a nonmetallic layer 24, by forming the nonmetallic layer 24 in the middle of a first magnetized layer 20. Accordingly, it is possible to cause electron reflection to occur even at an interface of a magnetic layer above or below a current path, in spite of using a metallic antiferromagnetic substance. Consequently, it becomes possible to minimize the loss of momentum of electrons, and to obtain an excellent bias magnetic field property, using the antiferromagnetic substance.



### LEGAL STATUS

[Date of request for examination] 20.09.2002

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]